

**ENSEÑANZA DE INGLÉS COMO LENGUAJE EXTRANJERO
(EILE)**

**ENGLISH LANGUAGE ACQUISITION FOR ELEMENTARY
SCHOOLS IN COSTA RICA**

A Senior Scholars Thesis

by

ANNABELLE NELSON

ENRIKA OLIVAREZ

Submitted to the Office of Undergraduate Research
Texas A&M University
in partial fulfillment of the requirements for the designation as

UNDERGRADUATE RESEARCH SCHOLAR

April 2011

Major: Bilingual Education

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Approved by:

Research Advisor:

Director for Honors and Undergraduate Research:

Rafael Lara-Alecio

Sumana Datta

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ABSTRACT

Enseñanza de inglés como lenguaje extranjero (EILE).
English Language Acquisition for Elementary Schools in Costa Rica. (April 2011)

Annabelle Nelson
Enrika Olivarez
Department of Bilingual Education
Texas A&M University

Research Advisor: Dr. Rafael Lara-Alecio
Department of Bilingual Education

Working with the Costa Rica Multilingual Foundation, the Costa Rican Ministry of Education, Costa Rica USA Foundation of Cooperation, the Inter-American Development Bank, and the researchers are completing a randomized trial study related to the effectiveness of technology-based English instruction. The purpose of the *Enseñanza del Inglés como Lenguaje Extranjero (EILE)* is to conduct an analysis of three differing English language programs across 81 specified Costa Rican Elementary Schools: (a) a technology-based intervention that is transitional, (b) a technology-based intervention that is English immersion, and (c) the typical practice English as a foreign language program. Lastly, we found that all groups of English language learning elementary students in Costa Rica improved in oral language development with specific English language instruction.

DEDICATION

This thesis is dedicated to all the children of the world who seek to understand the meaning and power of language.

ACKNOWLEDGMENTS

The scope and importance of this project are absolutely huge for us and our department. We would not have been able to complete this without the help of many. First and foremost, we want to acknowledge our faculty advisor, Dr. Rafael Lara-Alecio, for all his support and encouragement when we needed it the most. We thank him for believing in the power of research and how it can positively affect future bilingual educators and their students.

This project has been a collaboration with professors and graduate students who have helped us with data collection; therefore, we want to acknowledge Dr. Fuhui Tong, Dr. Beverly Irby (SHSU), Yinan Fan, Xuchen Xu, and Jennifer Smith. For this, we extend special gratitude for all their perseverance. Moreover, thanks to Polly Treviño for her feedback, her encouragement, and for teaching us the power of statistics.

Lastly, thanks to our co-workers at the Bilingual Education Program at Texas A&M University, Tiberio Garza, Maggie Huerta, Gaby Iturralde, Julia Stanka, Jessica Melecio, for their emotional and academic support through this process of writing a thesis. Thanks for giving us our home away from home. We extend our gratitude to Janie Kemp, the program manager, for never giving up on us.

It is because of these people that we were able to accomplish such a great thing: writing a thesis as undergraduates. We hope that we have given these people just as much pride and support as they have given us. For that, we will ever be grateful.

NOMENCLATURE

ANOVA	Analysis of Variance
CALL	Computer-Assisted Language Learning
ELL	English Language Learner

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this thesis is to share *Enseñanza de Inglés como Lengua Extranjera (EILE)*, an analysis of three differing English language programs across 81 specified Costa Rican Elementary Schools: (a) a technology-based intervention that is transitional, (b) a technology-based intervention that is English immersion, and (c) the typical practice English as a foreign language program.

Background

There are more than 3700 primary schools reported. Specifically, EILE is an investigation with 81 schools of native Spanish-speaking students who will study English via specific program components. Teachers in the 54 intervention schools may or may not be competent in English. Specifically, an average of 15 students per grade 3 will be assessed across the schools with schools being randomly assigned to conditions.

Theoretical framework

Rigorous scientific methodology has been equated to experimental research and

This thesis follows the style of *American Psychological Association Manual, Sixth Edition*.

technology has been has been a major source for enhancing curriculum and student achievement, and therefore may be a tool to increase the English language among bilingual students. An examination of the salient characteristics and benefits of a technology-enriched curriculum for ELLs underscores the pivotal role technology can play in second language teaching. Research in second language acquisition has clearly suggested the need of comprehensible input in order for second language learning to take place (Krashen, 1989).

Adding technology, computer-assisted language learning (CALL) as a tool to increase ELLs' English oral language development may begin to decrease the academic gap between groups of students. Students, who are exposed to different types of English acquisition activities or technology, while still enhancing their own native language may benefit the most. Levy (1997) defined CALL as "the search for and study of application of the computer in language teaching and learning" (p.1).

Few researchers have attempted to evaluate the effectiveness of more comprehensive uses of technology in language learning. Liu and Hou (2007) examined 464 articles published in *CALICO Journal*, a major CALL journal in the world, from 1983 to 2003 and found that only two articles comprehensively evaluated the effectiveness of a CALL program (i.e., Adair-Hauck, Willingham-McLain, & Youngs, 1999; Green & Youngs, 2001). Both studies were conducted at the university level in German and French over the course of one semester. In a study by Morgan (2008), three main themes surfaced as

concerns in the implementation of technology assisted English language learning program at the secondary level in northern Mexico. First, time was needed for teaching speaking and working with other teachers and the timing of the training was critical for teachers for the implementation of the program. Second, it was determined that the administrators were key in the success of the program specifically in two ways: support and their own bilingualism. Third, the resource of native English speakers as mentors was observed as a concern for the implementation of the program. In a study by Fidaoui, Bahous, and Bacha (2010), it was determined that Lebanese fourth grade students perceived the use of CALL as important, entertaining, nontraditional, and time-saving. According to Tang (2009) and based on the meta-analysis conducted on research methods and data analysis procedures employed by research studies investigating the applications of CALL to enhance second/foreign language learning, there is still a dire need for valid research designs and statistical analyses in this area.

Only three published works were found in over 10 databases including over 50,000 journals and publications from the Sterling Library at Texas A&M University that related to CALL and Costa Rica. One by Queseda (1998) was focused on internet-based English as a second language instruction at the university level. Another was by Umana Aguilar (2003) related to the use of linguistic text banks for translators. The other noted in the databases was by Edwards (1994) regarding mathematics exploration in Logo. Therefore, the significance of the EILE project as a controlled research study for elementary students and secondary students in Costa Rica is important as no such studies

have been conducted in the country to determine the effectiveness of CALL, nor have there been such studies in the Central American region.

CHAPTER II

METHODS

An experimental randomized trial test design was used in this study. The schools were selected from one province as assigned by the Ministry of Education (MEP).

It is important to implement a rigorous evaluation of an alternative curriculum and instructional model in the EILE at the elementary school level. The intended result is improved language development in second language, skills. English language proficiency is defined in this pilot as: the ability to master the basic linguistic elements (listening, speaking, reading, and writing) necessary to succeed academically in the school environment. Specifically we sought to answer the following question: To what extent do English language levels differ based among each intervention program based in a pre-post curriculum-based measures and other assessments?

Quantitative data which includes specific tests and specific quantifiable classroom observational data were analyzed using a series of pre-post and repeated measure designs. The efficacy of each program type was evaluated quantitatively using ANOVA (Analysis of Variance) with the pre-test measure as covariate and the post-test measure as dependent variable and curriculum-based assessments as repeated measures. The four dependent variables for this study that assisted in assessing the curriculum type impact in

English are: (a) oracy-receptive, expressive, (b) vocabulary, (c) literacy, and (d) comprehension. However, we are only going to look at (a) oracy-receptive, expressive for this case.

The number of schools required for this project was determined by a power analysis using Optimal Design (Liu, Spybrook, Congdon, Martinez, & Raudenbush, 2006), a software for multi-level clustered design. With the effect size pre-determined at .30 (small), alpha of .05, and intra-class correlation (ICC) of .05, a statistical power of .98 corresponds to a sample size of 80 schools (with an average of 15 students per school) (see figure 1). In cases where there are more than 15 students on one campus, a randomized block design (with each school as a unit of block) was implemented to randomly select students to meet the number needed and to ensure that each school participates in the project. The sample size by condition follows. In the province of Alajuela, a total of 81 schools were randomly selected and assigned to receive one of the following 3 conditions—Intervention A, Intervention B, and control— with 27 schools per condition for a balanced design. The total number of students required was 1,215.

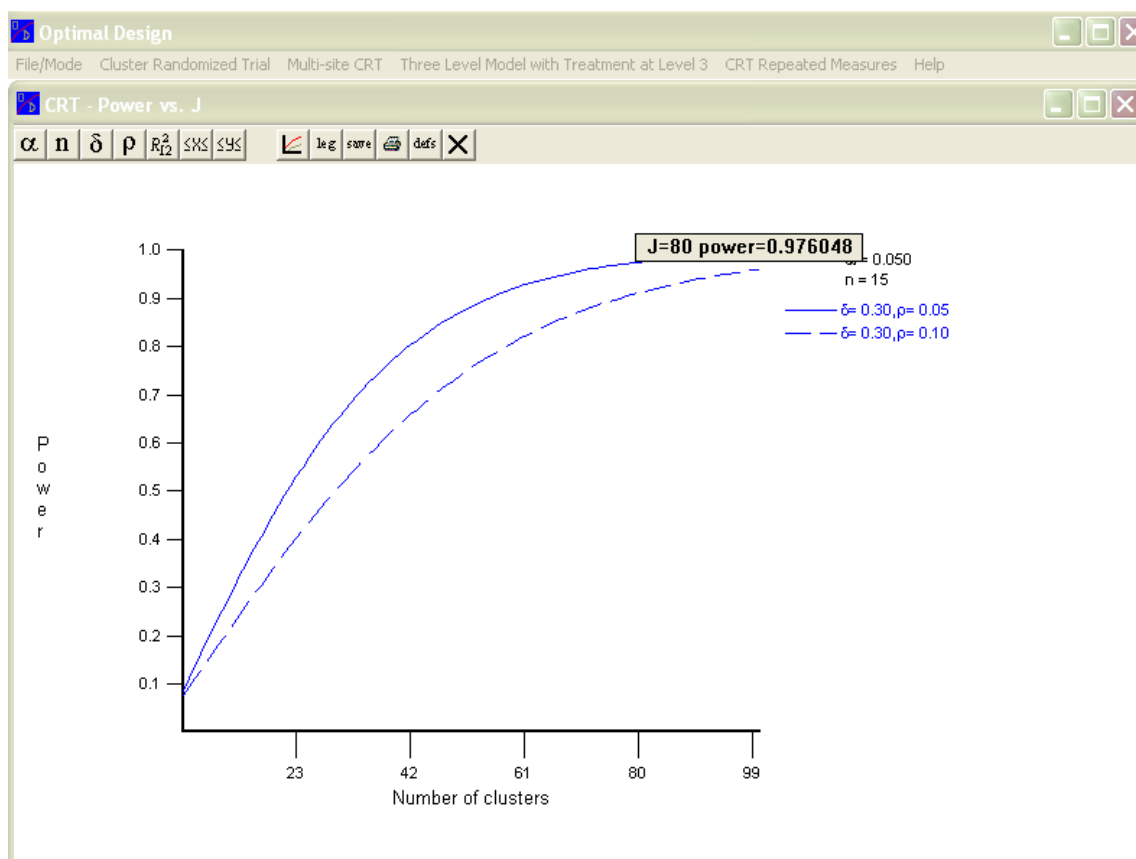


Figure 1. Optimal design for cluster randomized trial—power vs. number of clusters

CALL interventions

The two curricula computer-assisted language learning (CALL) components to be used are: (a) Intervention A and (b) Intervention B-- two differing types of curriculum with one being based on a model of bilingual education using the native language, Spanish, to acquire the second language, English and the other being based in a model of English foreign language education or structured English immersion.

Intervention A

This software intervention program is a step forward in English Language teaching. Based on extensive classroom experience, the latest research into how people learn, and upon accumulated data gathered and analyzed over 20 years in the field of CALL, Intervention A's courses take full advantage of what multimedia technologies can provide. There are significant differences between traditional, text-based approaches and the listening-based, visually supported approach that is at the heart of this intervention's *Recursive Hierarchical Recognition* (RHR) (Knowles, 2008) approach.

Intervention B

The software intervention program is structured to develop English oral language in Spanish speakers. It incorporates interactive sing-along rhymes, songs, chants, phonetics, listening and speaking commands, sentence structure, letter recognition, and phonemic awareness through fun self-recording games. One of the goals of this software is to increase oral language proficiency and assist students in becoming more confident when asking and answering English questions as well as becoming more actively engaged during ESL instruction time. The interactive game features of computer programs and the exploratory quality of the internet motivate students to use their second language. The untiring, non-judgmental nature of the computer makes it an ideal tool to help ELLs feel sufficiently secure to make and correct their own errors without embarrassment or anxiety (Krashen, 1989).

CHAPTER III

RESULTS

The final project sample size was a total of 679 students. A one-way between subjects ANOVA was conducted to compare the effect of Oral Expression Gain on 70 students (35 M and 35 F) that were randomly selected from each of the three conditions (Intervention A, Intervention B, and control; $n=210$). In order to proceed, it was necessary that we checked for the normality of distribution which resulted in skewness of $-.023$ and kurtosis of $.759$. Since both of these values were between 0 and 1, it was determined that the scores were normally distributed. Next, we ran a test of homogeneity of variances in which Levene's test was not statistically significant ($.398$); thus, this satisfies the assumption of equal variance for ANOVA.

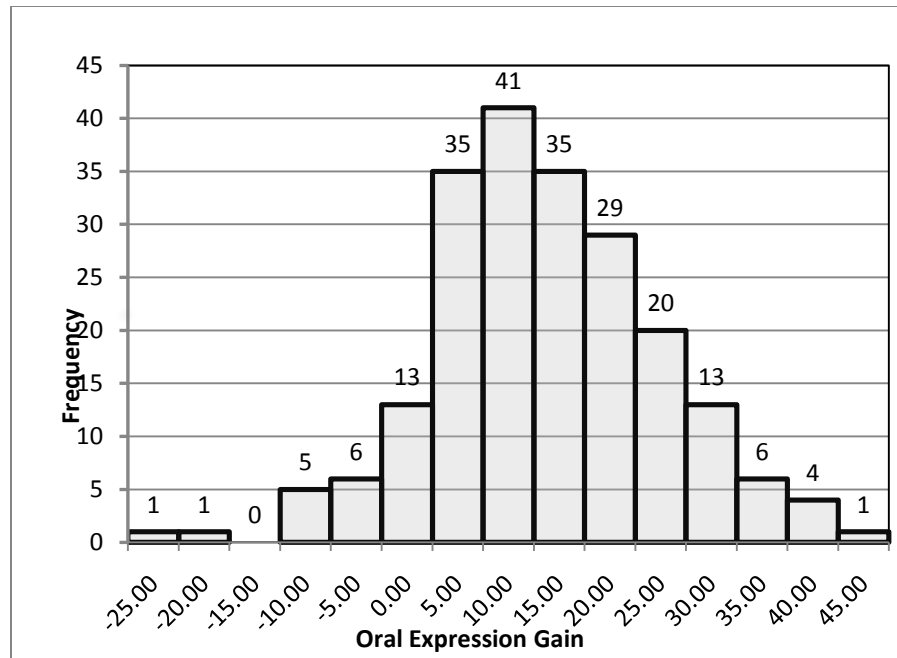


Figure 2. Distribution of oral expression gain ($n=210$)

The dependent variable was Oral Expression gain which was computed by subtracting the Posttest - Pretest W scores. This variable is the difference between the end score and beginning score or gain score (how much students improved). The W scores come from the Woodcock Muñoz Language Survey-Revised which is an assessment used to measure proficiency in English and Spanish. In this case, the focus was on the Oral Expression cluster in the English language. Descriptive statistics for the oral expression gain score are shown in Table 1.

Table 1.***Descriptive Statistics for Oral Expression Gain Score (n=210)***

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Statistic
Oral Expression Gain Score	210	-30.00	45.00	10.72	11.19

Difference between groups

We wanted to see if there was a difference between the 3 conditions (Intervention A, Intervention B, and control) in order to be able to answer the following: To what extent do English language levels differ based among each intervention program based in a pre-post curriculum-based measures and other assessments? The results of the ANOVA are shown in Table 2.

Table 2.***ANOVA Table Main Results***

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1091.5	2	545.75	4.5	.01
Within Groups	25062.49	207	121.08		
Total	26153.99	209			

Since the results were statistically significant ($p=.01$), this means that there are difference in group means. Effect size η^2 equals 0.044; so, 4.4% of the variance in students' gain scores is explained by membership in a certain condition or control group. In practical terms, this means that the three groups differ in amount of gain or

improvement; however, this did not explain which groups differed from each other.

Therefore, we ran *post hoc* tests in order to determine which groups differ from each other. Results are shown in Table 3.

Table 3.

***Post Hoc* Tests Results**

(I) Condition 1=Control 2=Intervention A 3=Intervention B	(J)Condition 1=Control 2=Intervention A 3=Intervention B	Mean Difference (I-J)	Std. Error	Sig.
1	2	-5.39*	1.86	.02
	3	-1.41	1.86	.75
2	1	5.39*	1.86	.02
	3	3.97	1.86	.11
3	1	1.41	1.86	.75
	2	-3.97	1.86	.11

The mean difference between Control and Intervention A was statistically significant ($p=.02$), whereas the mean difference between Control and Intervention B was not. The mean gain score for Intervention A was 5.39 points higher than the mean gain score for Control. On average, students who participated in Intervention A improved 5.39 points more than Control group participants on their Oral Expression scores. Intervention B's mean was 1.41 points higher than Control, but was not statistically significant. On average, Intervention B students improved more than Control students, but the difference in improvement was not statistically different from 0. When comparing the two Intervention groups: Intervention A students, on average, gained 3.97 more points on oral expression than Intervention B students gained. However, the difference in

improvement was not statistically significant. For practical significance, we calculated the effect sizes for differences between groups. The effect size that was used is called Cohen's d . The results were as followed:

- Intervention A v. Control – $d = .47$
- Intervention B v. Control – $d = .13$
- Intervention A v. Intervention B – $d = .37$

In the first bullet, there is a medium effect in favor of Intervention A. The second bullet shows that there is a small effect favoring Intervention B. Lastly, Intervention A is favored moderately over Intervention B.

CHAPTER IV

SUMMARY AND CONCLUSIONS

In summary, students who participated in Intervention A on average increased on the oral gain scores more than Intervention B. Participating in Intervention A or B increased students' oral gain scores when compared to the Control group's gain. Therefore, participating in either intervention was beneficial for students. However, because only 4.4% of the variance in students' gain scores can be explained by membership in treatment or control groups, we conclude that there are factors other than intervention participation (e.g., student characteristics, like aptitude or exposure to English, or teacher or school characteristics) that explain more variance in scores (i.e., that affect students oral expression improvements).

Along with the small effect of intervention, we determined the following positive outcomes:

- All groups of English language learning elementary students in Costa Rica improved in oral language development with specific English language instruction.
- Computer-assisted or technology-enhanced instruction among English language learners in elementary schools Costa Rica appears to result in higher oral language development.

REFERENCES

- Adair-Hauck, B., Willingham-McLain, L., & Youngs, B. E. (1999). Evaluating the integration of technology and second language learning. *CALICO Journal*, 19(2), 269-306.
- Edwards, L. D. (1994). Mathematical explorations in Logo: Report of a pilot study from Costa Rica. *Educational Technology*, 34(5), 56-61.
- Fidaoui, D., Bahous, R., & Bacha, N. (2010). CALL in Lebanese elementary ESL writing Classrooms. *Computer Assisted Language Learning*, 23(2), 151-168.
- Green, A. & Youngs, B. E. (2001). Using the web in the elementary French and German courses: Quantitative and qualitative study results. *CALICO Journal*, 19(1), 89-123.
- Knowles, L. (2008). Recursive hierarchical recognition: A brain-based theory of language learning. *FEELTA/NATE Conference Proceedings*.
<http://www.backbonecommunications.com/wp-content/uploads/dyned-2008-a-brain-based-theoryrev.pdf>.
- Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the input hypothesis. *The Modern Language Journal*, 73, 440-464.
- Liu, M., & Hou, H. (2007). Computer assisted language learning (CALL) in China: Some common concerns. *Asian EFL Journal*, 19 (1). http://www.asian-efl-journal.com/pta_April_07_ml&hh.php
- Morgan, B. (2008). *A description of the implementation of the Technology-Assisted Language Learning (TALL) system into two English language learning classes at a private religious school in northern Mexico*. Dissertation abstracts international [0419-4209] Morgan yr: 2008 vol:69 iss:3-A pg:949.
- Queseda Pacheco, A. (1998). Internet-based ESL instruction at the university level. *Kanina: Revista de Artes y Letras de la Universidad de Costa Rica*, 22(3). 95-108.
- Raudenbush, S. W., Liu, X.-F., Spybrook, J., Martinez, A., & Congdon, R. (2006). Optimal Design software for multi-level and longitudinal research (Version 1.77) [Computer software]. Available at <http://sitemaker.umich.edu/group-based>

- Tang, H.W.V. (2009). A meta-analytic review of current CALL research on second language learners. *IEEE International Symposium on IT in Medicine Proceedings*, 677-684.
- Umana Aguilar, J. (2003). Uso de bancos de textos linguisticos para la formacion de traductores. *Revista de Filologia y Lingüística de la Universidad de Costa Rica*, 29(1). 74-159.

CONTACT INFORMATION

Name:	Annabelle Nelson Enrika Olivarez
Professional Address:	Rafael Lara-Alecio, Ph.D. Bilingual Programs Department of Educational Psychology Professor & Director 107 H Harrington Tower, EDTC 4225 TAMU Texas A&M University College Station, TX 77843-4225 a-lara@tamu.edu
Email Address:	ann3307@neo.tamu.edu eiolivarez1@neo.tamu.edu
Education:	Annabelle Nelson B.S., Interdisciplinary Studies, Texas A&M University, December 2011 Undergraduate Research Scholar Enrika Olivarez B.S., Interdisciplinary Studies, Texas A&M University, May 2012 Undergraduate Research Scholar